

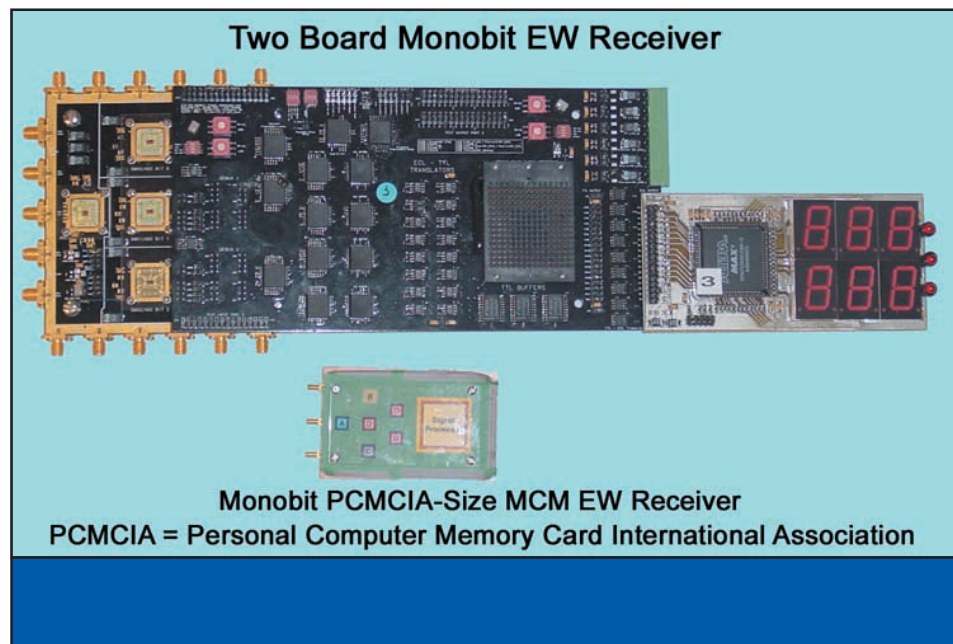


# Air Force Research Laboratory | AFRL

*Science and Technology for Tomorrow's Aerospace Forces*

## Success Story

### LOW-COST DIGITAL ELECTRONIC WARFARE RECEIVER



Scientists at the Sensors Directorate designed and developed Monobit, an affordable cueing receiver, which processes and detects simultaneous signals to enhance situation awareness. This new design uses a cost-effective and reprogrammable field programmable gate array. The multiple-chip module (MCM) design integrates all the components, greatly reducing size, weight, and power. The Monobit receiver improves and upgrades the performance of tactical; strategic; intelligence, surveillance, reconnaissance; and space systems to improve warfighting capabilities.



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### **Accomplishment**

Directorate scientists demonstrated a low-cost digital electronic warfare (EW) receiver that processes two simultaneous signals in 1 GHz bandwidth. This new receiver, manufactured on a single MCM, will provide 20 times the reduction in weight, 10 times the reduction in power, and less than 1% false alarm rate with improved reliability.

### **Background**

In EW, a broadband radio receiver, such as the instantaneous frequency measurement receiver, senses a target by intercepting an incoming radio frequency (RF) signal. Directorate scientists designed and developed a new, unique, and simple-to-implement EW receiver called the Monobit receiver. The hardware consists of an RF front-end, analog-to-digital converter; de-multiplexer; and a signal-processing chip.

This new digitized EW receiver handles two simultaneous signal sources and provides the operator with information indicating detection of a hostile signal. The basis of the receiver is real-time application of the discrete Fourier transform mathematical function with a single binary-bit kernel function. The Fourier transform, accomplished through the mathematical operations of addition and subtraction, eliminates the multiplication operation and enables much higher speed signal-processing.

Sensors  
Support to the Warfighter

### **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (01-SN-01)